

AMENDMENTS TO THE DRAWINGS:

Figure 3 has been amended to add a lead line and the reference numeral 19 indicating the toroidal core 19.

REMARKS

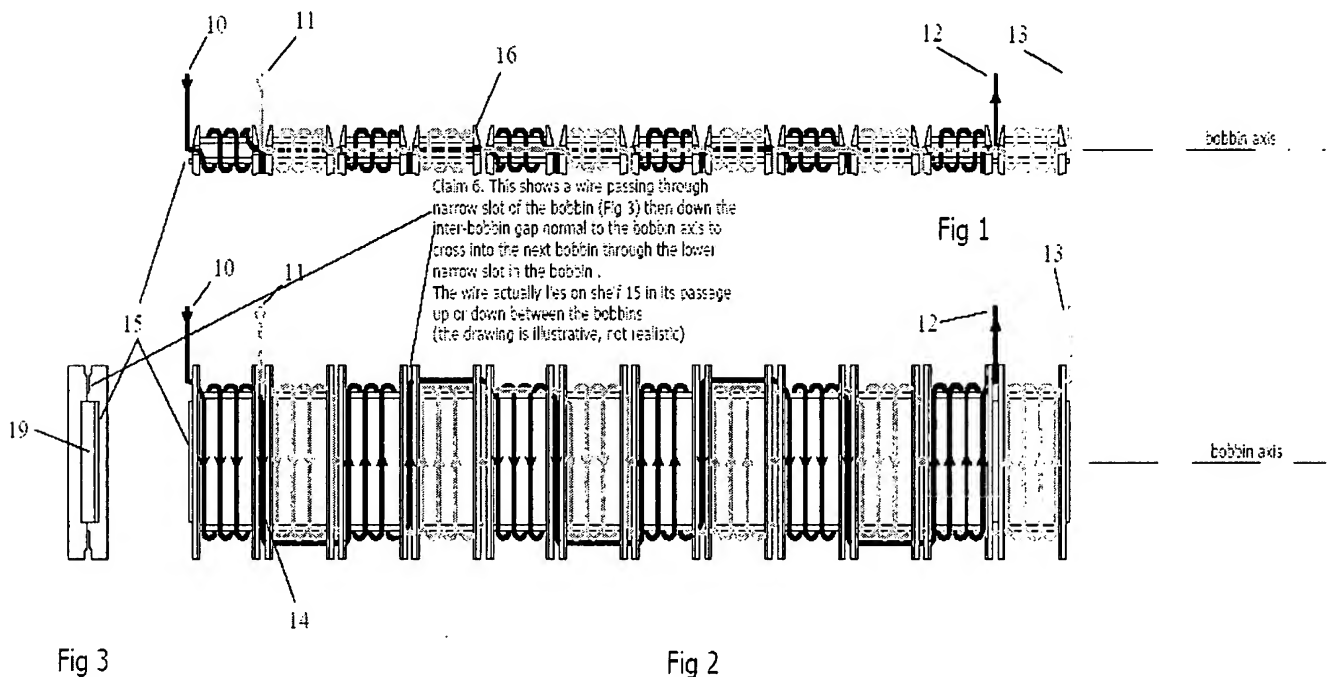
The application has been amended and is believed to be in condition for allowance.

This amendment is being filed as part of an RCE application.

Claims 12-20 have been cancelled, mooting the drawing objection. There are no further formal matters pending.

Claims 1 and 8 are independent. Claim 23 is new and is independent. The claims find support in the original specification disclosure and therefore do not add new matter.

Annotated Figures 2-3 are reproduced below, showing the bobbin axis and well as claimed features.



Claims 1 and 8 are amended to require that the initial rectilinear array of wound bobbins be formed by bending as a whole into a circular array.

The invention thus provides a support for the connecting wires in both the circular and rectilinear forms. The provided support eases winding while in the rectilinear form and ensures that the winding will not fatigue and break due to magnetic and thermal effects associated with such machines in use in the circular form.

See the annotated portions of Figures 4-5 below.

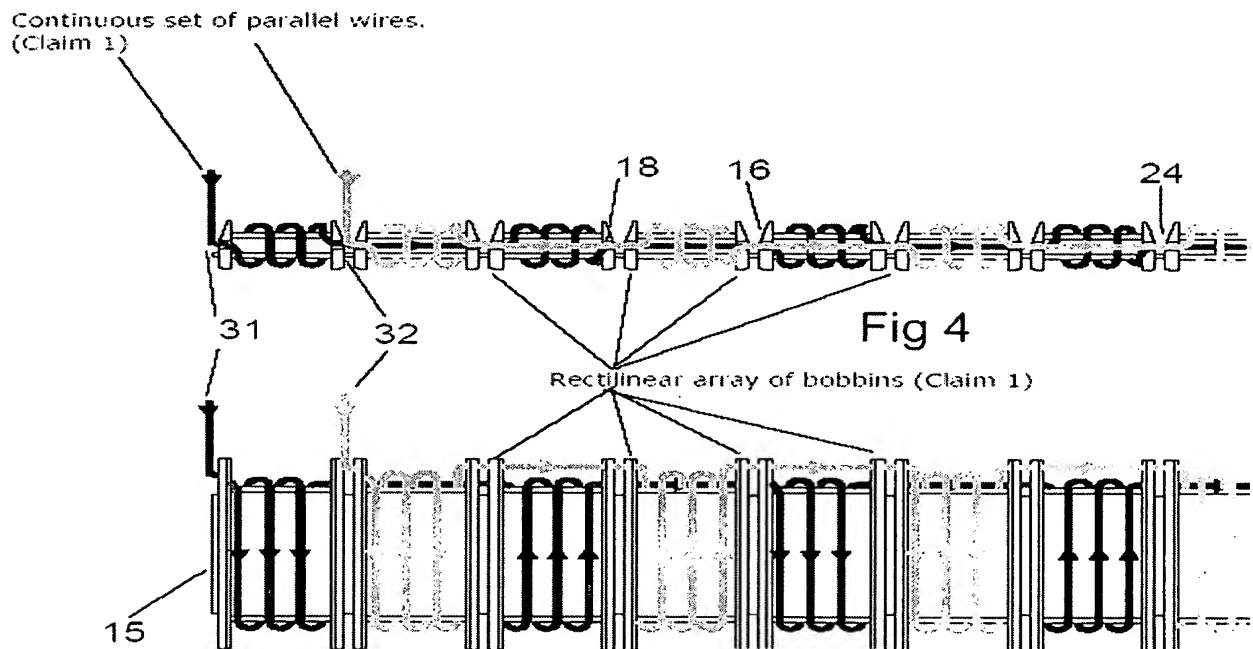
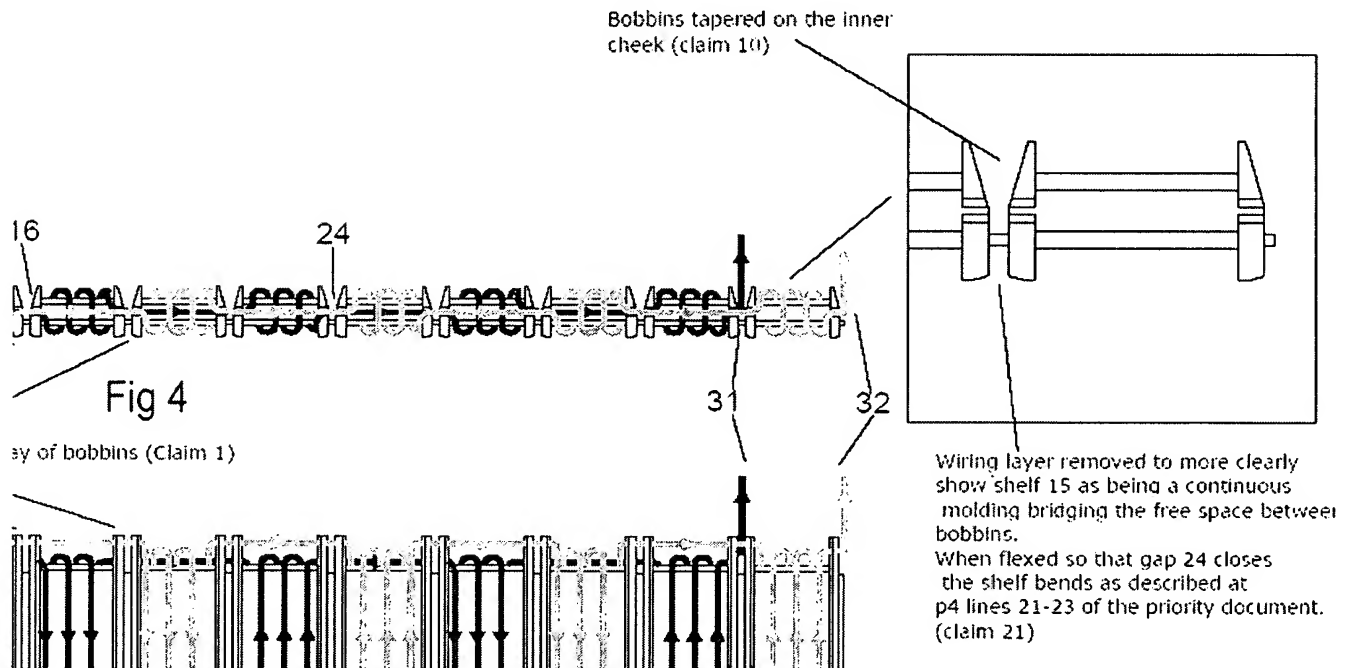


Fig 5

This amendment makes clear that the claims do not read onto a rectilinear array of bobbins that may be separated and then, once separated, formed into a circular array.

These claims are both novel and non-obvious.

A further view of Figure 4 is annotated and provided below.



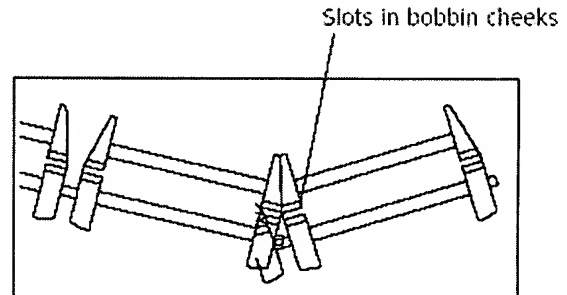
Additionally, please see the montage provided below.

In the montage there is shown two slightly tilted views demonstrating that when the bobbin array is bent, the path between bobbins via the slots of Figure 3 fully supports the wire, as per claim 6. This montage also demonstrates that when continued to a circle, it would provide physical contact of the

sides of each bobbin (as per claims 1, 9) forming an arch structure.



Fig 5



This montage of two slightly tilted views demonstrates that when the bobbin array is bent the path between bobbins via the slots of Fig 3 fully supports the wire (Claim 6). Also demonstrates that if continued to a circle it would provide physical contact on the sides of each bobbin (Claims 1, 9) forming an arch structure.

Substantive Rejections

Claims 1, 2, 8, 10 and 11 were rejected as anticipated by SHTEYNBERG 6,941,644.

Claims 3-7 and 9 were rejected as obvious over SHTEYNBERG and TANAKA 4,639,707.

SHTEYNBERG was offered as teaching a set of wound bobbins 15 initially wound as rectilinear axially aligned array of adjacent bobbins, and thereafter formed into a circular array.

SHTEYNBERG is also offered as teaching to wind the bobbins from a continuous wire or a continuous set of parallel wires.

Reference is made to SHTEYNBERG Figures 3-4.

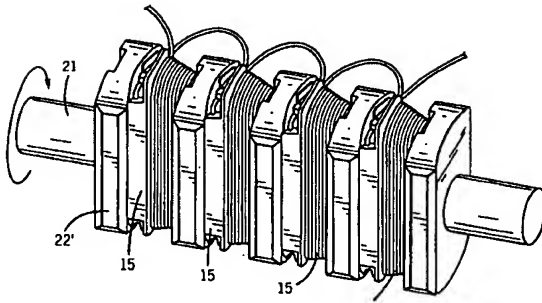


FIG. 3

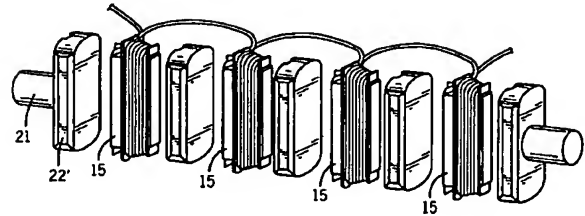


FIG. 4

SHTEYNBERG Figure 3 shows a set of wound bobbins 15 initially wound as rectilinear axially aligned array of adjacent bobbins, with outer end sections 22a, 22e and nests 22b, 22c, 22d. The nests provide spacing which acts to set the wire length between bobbins.

SHTEYNBERG Figure 4 shows an exploded view of Figure 4, clearly illustrating that the individual bobbins 15 are not connected to each other.

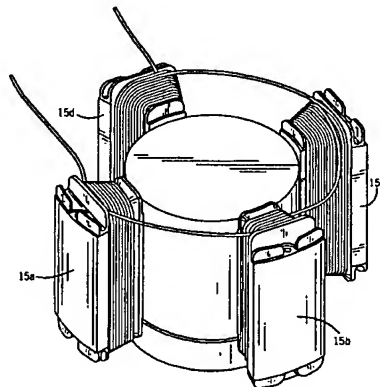


FIG. 5

Figure 5, above, shows the wound segments arranged in a circular arrangement to form part of a stator (column 4, lines 1-3).

As is clearly illustrated, the SHTEYNBERG method separates the adjacent bobbins of the rectilinear axially aligned array in order to mount the bobbins in a circular array. Note that the wire between the bobbins is unsupported and subject to breakage (See new claims 26-27 requiring that the bobbins are provided with pathways to everywhere support the wires as they pass from one bobbin to another).

SHTEYNBERG does not, however, teach first that the rectilinearly located bobbins are wound with a continuous wire or a continuous set of parallel wires for each phase to form the wound rectilinear array of bobbins, and second the wound rectilinear array of bobbins then being formed, by bending as a whole, into a circular array as an electrodynamic machine winding.

Nor could the method of SHTEYNBERG be modified to satisfy this recitation and SHTEYNBERG teaches, as per Figures 3-4, to hold a set of bobbins 15 between outer end sections 22a, 22e, the outer end sections 22a, 22e pressing the bobbins 15 together as part of a rotatable clamp 20 (see Figures 1, 2). Once the outer end 22a, 22e are removed, the bobbins are no longer held together and naturally must separate from each other, being only connected to one another by the wiring.

TANAKA does not provide any teaching that would lead one of skill to modify SHTEYNBERG.

TANAKA discloses a toroidal transformer, rather than a toroidal electrodynamic machine. In TANAKA the coils are wound singly in the normal toroidal manner onto a toroidal core 1 having an annular top winding frame 2C and an annular bottom winding frame 2D, the coils 3A being fitted into grooves 2a in the frames. There is no teaching to bobbins and Figures 1-3 do not show bobbins. Note especially that the coils are wound singly in situ and the conductors interconnecting the coils may be located in a groove in the top winding frame 2C.

The Official Action offers column 3, lines 18-35. However, this passage relates to the grooves in the annular top or bottom frames and the location of the interconnection between two coils in a groove between coil locating abutments on these frames. This passage has no relevance to the method of SHTEYNBERG.

Each of the independent claims is therefore believed to be both novel and non-obvious.

The Official Action fails to identify the features of claim 3, i.e., that the assembly of pre-wound and electrically connected bobbins is formed into a circular array positioned about a toroidal core of magnetic material, such core passing through an aperture in each bobbin. It is respectfully requested that the Official Action indicate, with specificity, how/why

SHTEYNBERG would be modified to include a magnetic material toroidal core, this core passing through an aperture in each bobbin. The bobbins of SHTEYNBERG do not include an aperture, and there is no teaching as to providing a toroidal core.

As noted above, TANAKA discloses a toroidal transformer, rather than a toroidal electrodynamic machine. Thus, there is no teaching to bobbins or to constructing a circular array as an electrodynamic machine winding.

The Official Action fails to identify the features of claim 4, i.e., that the bobbins interfit, to positively locate with each other.

The Official Action fails to identify the features of claim 5, i.e., that the bobbins are manufactured jointly, as a single part or multiple inter-fitting parts which may be deformed into a toroid after winding.

The Official Action fails to identify the features of claim 6, i.e., that the bobbins are provided with pathways to support the wires as they pass from one bobbin to another.

The Official Action fails to identify the features of claim 7, i.e., that part of the pathway extends normal to a bobbin axis between two bobbins.

The assertions made on Official Action page 4, last paragraph, are without support. It is respectfully requested that these rejections be withdrawn or that they be detailed to

indicate specifically where the recited support matter is disclosed.

The same points apply to the device claims and the corresponding new claims.

SHTEYNBERG does not teach, as per claims 21-22, and 24 that the set of bobbins is a single assembly of moulded plastic bobbins with adjacent bobbin pairs connected at a join, and that during said forming step, the wound bobbins are bent along one side and at a top and a bottom of the join between each pair of bobbins to form the circular coil. See that SHTEYNBERG specifically teaches the bobbins being separated from each other and then placed in final position. There is no bending at a join.

As per claim 23, neither reference teaches forming the wound rectilinear array of bobbins, by bending the wound rectilinear array of bobbins as a whole, into a circular array as a circular coil for the toroidally wound machine with the adjacent bobbins being in physical contact.

As noted, SHTEYNBERG teaches bobbins which are not adjacently fixedly joined, in contrast to claim 25.

The features of claims 28-29 are not taught or suggested by SHTEYNBERG. SHTEYNBERG does not include bobbins with an external shelf, one edge of each external shelf forming a pivot axis between the bobbins (there is no need for this in SHTEYNBERG). SHTEYNBERG teaches the wire being unsupported between bobbins. This is in contrast with the wire routed

between bobbins and continuously supported by the external shelf. SHTEYNBERG does not teach that the bobbins each have tapered edges on one side for defining a curved path when forming the wound bobbins into the circular array.

There is no relevant teaching in TANAKA that would lead one of skill to modify the SHTEYNBERG design/method.

SHTEYNBERG does not teach that the bobbins each have a cavity and an extension such that the extension of each bobbin fits into the cavity of an adjacent bobbin, as claimed.

The recited features of the claims being neither anticipated nor rendered obvious, each of the claims is believed patentable.

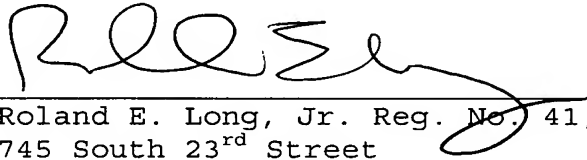
Withdrawal of the rejections and allowance of the claims are therefore respectfully requested.

Should there be any matters that need to be resolved in the present application, the Examiner is respectfully requested to contact the undersigned at the telephone number listed below.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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REL/lrs

APPENDIX:

The Appendix includes the following item:

- replacement drawing sheet